

Remarks

Reconsideration of the application is respectfully requested in view of the preceding amendments and for the following reasons.

Attached please find a certified copy of the German application, as required by 35 U.S.C. § 119 (b), which provides the foreign priority claim for the instant application.

Objection to the Drawings

The drawings were objected to because Fig. 1, was not labeled "Prior Art" and the reference sign "U_B" was not included, and the Examiner had requested that appropriate correction should be made to the figures. The Applicant is herewith submitting a red-lined drawing with the requested correction. Therefore, the applicant respectfully requests that the Examiner kindly withdraw the objection to the drawings.

Rejection under 35 U.S.C. § 112, second paragraph, with respect to Claims 2-4

Claims 2-4, were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In support of the rejection, the Examiner has stated that "Claim 2 does not specify what the negative operating voltage is utilized for with respect to claim 1." The Applicant has amended claim 2, as suggested by the Examiner.

"In claim 4", it was unclear to the Examiner "what is meant by the term "analyzing a negative probe voltage"." The Applicant has appropriately amended claim 4 to overcome this rejection.

Withdrawal of the rejection under 35 U.S.C. § 112, second paragraph, is hereby respectfully requested.

Rejection under 35 U.S. C. § 103 (a) with respect to claims 1, 5 and 6

Claims 1, 5 and 6 have been rejected under 35 U.S.C. § 103(a), the Patent Office contending that these claims are unpatentable over Kato et al (U.S. Patent No.

4,909,922). It is respectfully submitted that this rejection should be withdrawn for the following reasons.

Kato is directed to an oxygen sensor 10, with a built-in heater 36. However, there is no teaching and/or disclosure in Kato to have the at least one second electrode being coupled to the ground, as disclosed and claimed by the Applicant. Similarly, there is no teaching and/or disclosure in Kato to have the at least one first electrode coacting with the at least one second electrode and being negatively polarized, as disclosed and claimed by the Applicant.

As a matter of fact, Kato teaches away from applicant's invention when in column 6, lines 46-50, he connects the heating element 30, to the measuring electrode 22, via the conductor path 46, as more clearly shown in Figures 1 and 2. Whereas, the Applicant is disclosing and claiming that the first or the measurement electrode 12, be electrically connected to the second or the reference electrode 13, with the second or the reference electrode 13, being connected to the ground.

Claims 5 and 6, are dependent on Claim 1, and as such are patentable, as claim 1 is clearly patentable.

For the reasons discussed above, withdrawal of the rejection under 35 U.S.C. §103 (a), with respect to claims 1, 5 and 6, is hereby respectfully requested.

Rejection under 35 U.S. C. § 103 (a) with respect to claims 2-4

Claims 2-4, have been rejected under 35 U.S.C. § 103(a), the Patent Office contending that these claims are unpatentable over Kato (U.S. Patent No. 4,909,922) in view of Logothetis et al ("High-temperature Oxygen Sensors", ACS Symposium Series). It is respectfully submitted that this rejection should be withdrawn for the following reasons.

The earlier discussion with reference to Kato is incorporated herein by reference.

Logothetis discloses high temperature oxygen sensors based on electrochemical oxygen pumping, as more clearly shown with reference to figures 1 and 2.

However, Logothetis teaches away from applicant's invention when he applies the external voltage V to the platinum electrodes via a load resistor R_L . He needs this arrangement to apply the voltage V across the ZrO_2 cell to transfer oxygen from one side to the other side of the cell, as more clearly discussed with reference to his figure 2. Whereas, the Applicant is disclosing and claiming that the first or the measurement electrode 12, be electrically connected to the second or the reference electrode 13, with the second or the reference electrode 13, being connected to the ground.

Additionally, the Applicant is disclosing and claiming that the electrochemical sensor has at least one heating element, which is neither disclosed nor taught by Logothetis.

Even if one were to combine Logothetis with Kato, the resulting device would be considerably different than what has been disclosed and claimed by the Applicant. For example, one could get an invention with the heating element 30, of Kato between the two electrodes of Logothetis, which is of course very different than what is disclosed and claimed by the Applicant.

Additionally, Claims 2-4, are dependent on Claim 1, and as such are patentable, as claim 1, is clearly patentable.

For the reasons discussed above, withdrawal of the rejection under 35 U.S.C. § 103 (a), with respect to claims 2-4, is hereby respectfully requested.

Rejection under 35 U.S.C. § 103 (a) with respect to claim 1

Claim 1, has been rejected under 35 U.S.C. § 103(a), the Patent Office contending that this claim is unpatentable over Stahl et al (U.S. Patent No. 4,400,260). It is respectfully submitted that this rejection should be withdrawn for the following reasons.

Stahl is directed to a shielded, heated electrochemical gas sensor, where a solid electrolyte element 25 separates the first or reference electrode 27 from the second or measuring or sensing electrode 29, with a heating element 30, adjacent to the second or the measuring electrode 29.

However, Stahl teaches away from Applicant's invention when in figure 5, and the corresponding text, he teaches that the first or the reference electrode 27 has an independent terminal 34, and that the second electrode 29 be connected to the positive terminal 35, through the heating element 30, which is of course very different than what is disclosed and claimed by Applicant. Applicant is clearly disclosing and claiming that the at least one second electrode is coupled to the ground. Similarly, there is no teaching and/or disclosure in Stahl to have the at least one first electrode coacting with the at least one second electrode and being negatively polarized, as disclosed and claimed by Applicant.

For the reasons discussed above, withdrawal of the rejection under 35 U.S.C. § 103 (a), with respect to independent claim 1, is hereby respectfully requested.

Rejection under 35 U.S.C. § 103 (a) with respect to claims 1-6

Claims 1-6, have been rejected under 35 U.S.C. § 103(a), the Patent Office contending that these claims are unpatentable over Murase et al (U.S. Patent No. 5,413,683). It is respectfully submitted that this rejection should be withdrawn for the following reasons.

Murase teaches an oxygen sensing apparatus 10, and a method using electrochemical oxygen pumping action to provide reference gas, where solid electrolyte layers 12 and 14, with spacer 15, and a gas tight ceramic layer 23, have a first electrochemical cell 28, comprising a measuring electrode 20, and a reference electrode 24, and a second electrochemical cell 36, comprising a first or outer electrode 32, and a second electrode 30, such that the second electrode 30, and the measuring electrode 20, are in the same gas measurement chamber 16. This structure and arrangement is very different than what is disclosed and claimed by Applicant wherein the at least one second electrode is coupled to the ground. Similarly, there is no teaching and/or disclosure in Murase to have the at least one first electrode coacting with the at least one second electrode and being negatively polarized, as disclosed and claimed by the Applicant.

As a matter of fact, Murase teaches away from Applicant's invention when in

figures 1 and 2, and the corresponding text, he teaches that the measuring electrode 20, and that the second electrode 30, be in the same gas measurement chamber 16, and be exposed to the same gas.

Similarly, Murase teaches away from Applicant's invention when in column 12, lines 32-35, he states that "The oxygen sensing apparatus (10, 50) may be provided with suitable heating means (not shown) as needed for holding the solid electrolyte layers (12, 14, 52) at an appropriate elevated temperature." The heating means could be an external heating means, such as, a furnace. Similarly, to hold all the layers 12, 14 and 52 at the same elevated temperature Murase would have to use either an external heating means or a plurality of internal heating means all linked to provide the appropriate elevated temperature. In any event, the invention of Murase is very different than what is disclosed and claimed by the Applicant. For example, Murase does not disclose and/or teach that the at least one second electrode being coupled to the ground. Similarly, there is no teaching and/or disclosure in Murase to have the at least one first electrode coating with the at least one second electrode and being negatively polarized, as disclosed and claimed by the Applicant.

For the reasons discussed above, withdrawal of the rejection under 35 U.S.C. § 103 (a), with respect to claims 1-6, is hereby respectfully requested.

Conclusion

It is believed that this application is now in condition for allowance and applicant respectfully requests such action.

Respectfully submitted,

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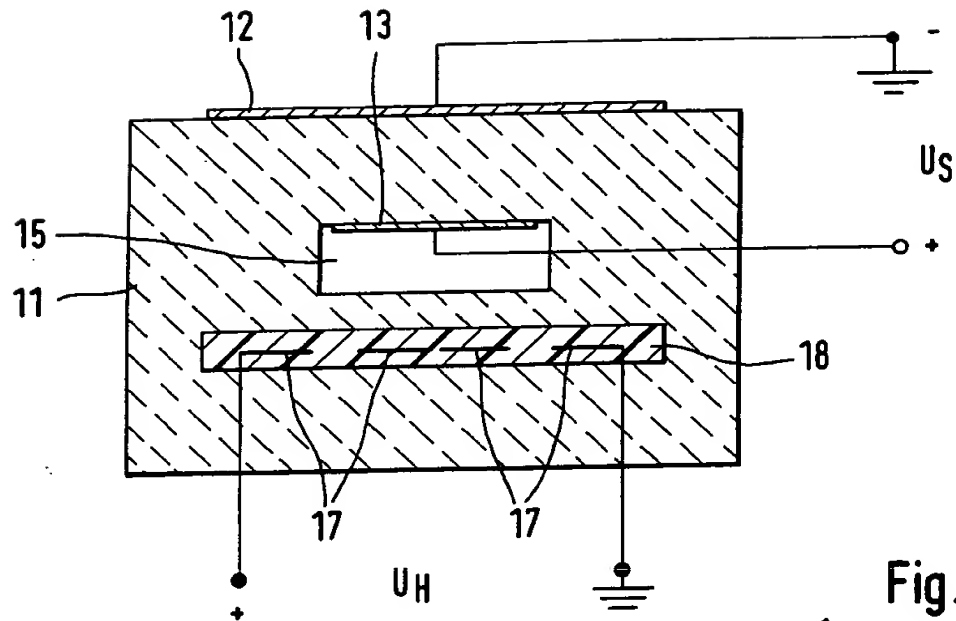


Fig.1
(PRIOR ART)

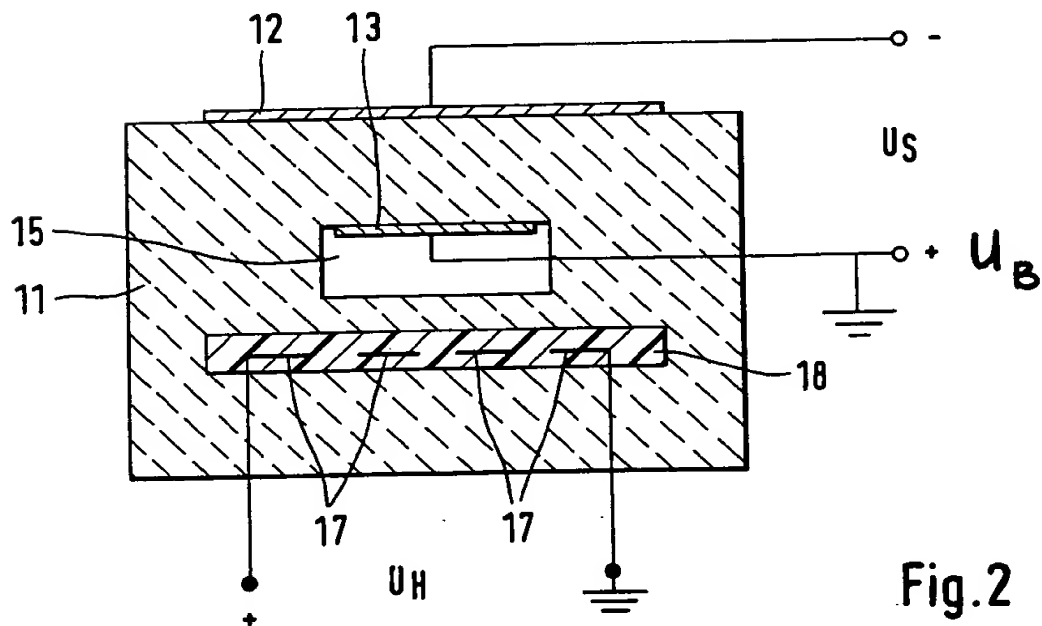


Fig.2